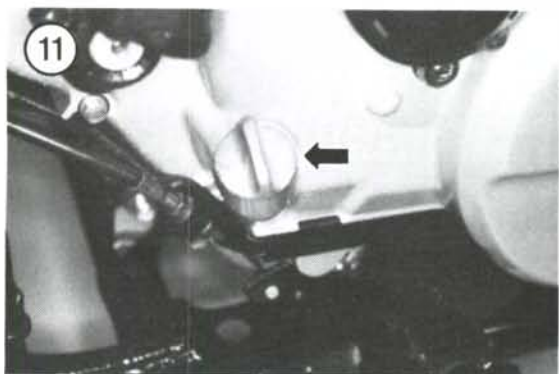


Use the following suggested charging amperage and length of charge time:

- a. Standard charge: 1.4 amps at 5 to 10 hours.
  - b. Quick charge: 6.0 amps at 1 hour.
4. Turn the charger ON.
  5. After the battery has been charged for the specified amount of time, turn the charger off and disconnect the charger leads.
  6. Connect a voltmeter across the battery negative and positive terminals and measure the battery voltage. A fully charged battery should read 13.0-13.2 volts. If the voltage is 12.3 or less, the battery is undercharged.
  7. If the battery remains stable for 1 hour at the specified voltage, the battery is considered charged.
  8. Clean the battery terminals and surrounding case. Coat the terminals with a thin layer of dielectric grease to retard corrosion and decomposition of the battery.
  9. Reinstall the battery as outlined under *Removal/Installation*.



### Battery Electrical Cable Connectors

To ensure good electrical contact between the battery and the electrical cables, the cables must be clean and free of corrosion.

1. If the electrical cable terminals are badly corroded, disconnect them from the vehicle's electrical system.
2. Thoroughly clean each connector with a wire brush and then with a baking soda solution. Wipe dry with a clean cloth.
3. After cleaning, apply a thin layer of dielectric grease to the battery terminals before reattaching the cables.
4. If disconnected, connect the electrical cables to the vehicle's electrical system.
5. After connecting the electrical cables, apply a light coating of dielectric grease to the electrical terminals of the battery to retard corrosion and decomposition of the terminals.

### New Battery Installation

Always replace the sealed battery with another sealed-type battery. The charging system is designed to have this type of battery in the system.

When replacing the old battery with a new one, be sure to have it fully charged before installing it in the vehicle. Failure to do so will permanently damage the new battery.

## PERIODIC LUBRICATION

### Engine Oil Level Check

Engine oil level is checked with the dipstick/oil fill cap (Figure 11), located on the rear right-hand side of the engine.

1. Start the engine and let it warm up approximately 2-3 minutes.
2. Place the vehicle on level ground and apply the parking brake.
3. Shut off the engine and let the oil settle.
4. Unscrew the dipstick/oil fill cap (Figure 11) and wipe it clean. Reinsert it onto the threads in the hole; do not screw it in. Remove it and check the oil level. The vehicle must be level for a correct reading.
5. The level should be between the 2 lines and not above the upper one (Figure 12). If necessary, add

the recommended type oil to correct the level. Install the dipstick/oil fill cap and tighten it securely.

### Engine Oil and Filter Change

Regular oil changes will contribute more to engine longevity than any other maintenance performed. The factory recommended oil and filter change is listed in **Table 1**. This assumes that the vehicle is operated in moderate climates. If it is operated under dusty conditions, the oil will get dirty more quickly and should be changed more frequently than recommended.

Use only a high quality detergent motor oil with an API classification of SF or SG. The classification is stamped or printed on top of the can or label on plastic bottles (**Figure 13**). Try to use the same brand of oil at each oil change. Refer to **Figure 14** for correct oil weight to use under anticipated ambient temperatures (not engine oil temperature).

To change the engine oil and filter you will need the following:

- Drain pan.
- Funnel.
- 17 mm wrench.
- 3 quarts of oil.

There are a number of ways to discard the old oil safely. Some service stations and oil retailers will accept your used oil for recycling; some may even give you money for it. Never drain the oil onto the ground.

#### NOTE

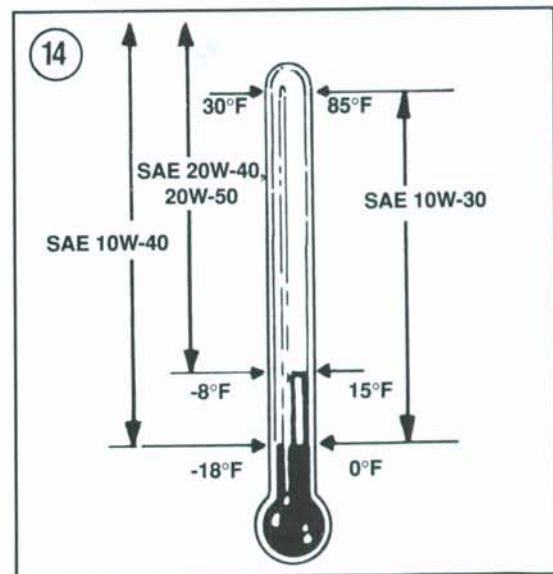
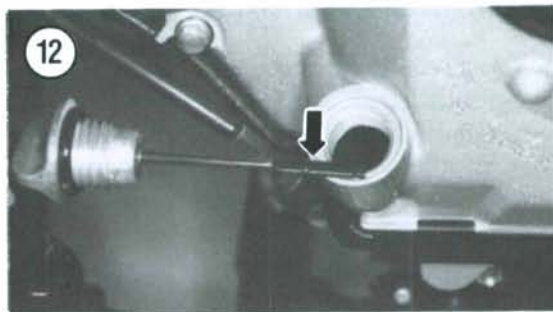
*Never dispose of motor oil in the trash, on the ground, or down a storm drain. Many service stations accept used motor oil and waste haulers provide curbside used motor oil collection. Do not combine other fluids with motor oil to be recycled. To locate a recycler, contact the American Petroleum Institute (API) at [www.recycleoil.org](http://www.recycleoil.org).*

#### NOTE

*Warming the engine allows the oil to heat up; thus it flows freely and carries contamination and any sludge buildup out with it.*

- Start the engine and let it warm up approximately 2-3 minutes.

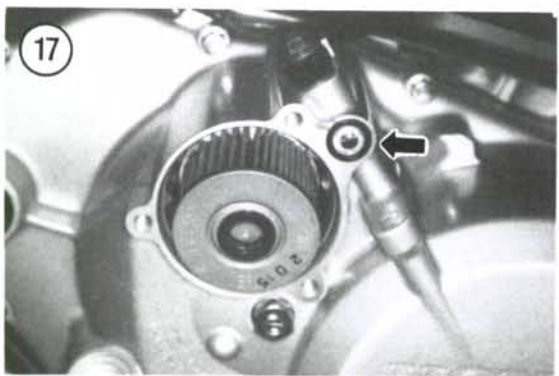
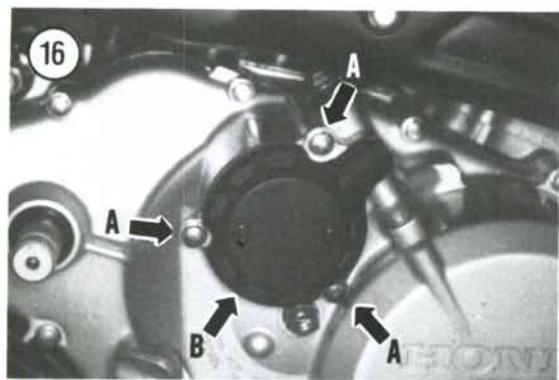
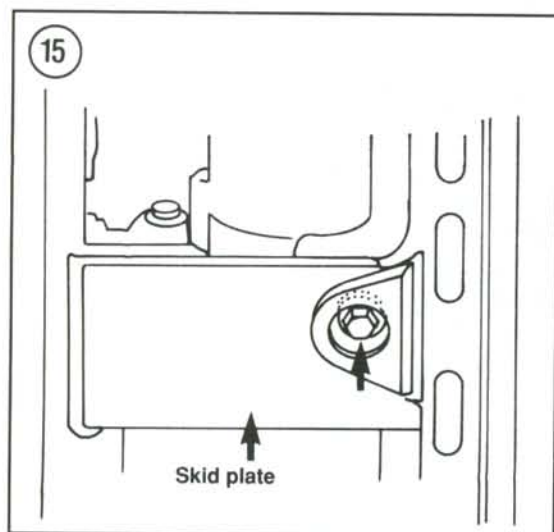
- Place the vehicle on level ground and apply the parking brake.
- Shut it off and place a drain pan under the engine.
- Remove the 17 mm drain plug that is accessible through the hole in the engine skid plate (**Figure 15**).
- Remove the dipstick/oil fill cap, this will speed up the flow of oil.
- Let it drain for at least 15-20 minutes.



**CAUTION**

*Do not let the engine start and run without oil in the crankcase. Make sure the ignition switch and engine kill switch are in the OFF position.*

7. Turn both the ignition switch and the engine kill switch to the OFF position and use the kickstarter or



starter a couple of times to help drain any remaining oil.

8. To remove the oil filter, perform the following:
- Remove the bolts (A, **Figure 16**) securing the filter cover on the right-hand crankcase cover and remove the filter cover (B, **Figure 16**). Don't lose the small O-ring seal (**Figure 17**) in the right-hand crankcase half.
  - Remove the filter (**Figure 18**) and spring (**Figure 19**). Discard the filter. Don't lose the spring.
  - Thoroughly clean out the filter receptacle in the crankcase cover with a shop cloth and solvent and, if necessary, scrape out any oil sludge with a broad-tipped dull screwdriver.
  - Inspect the O-ring seal (**Figure 20**) on the filter cover. Replace if it has become hard or is starting to deteriorate.
  - Install the spring (**Figure 19**) into the crankcase.

**CAUTION**

*If the oil filter is installed backwards, oil flow will be restricted leading to costly engine damage.*



- f. Position the new oil filter with the flat surface (A, **Figure 21**) facing in toward the spring (B, **Figure 21**) and with the "OUTSIDE" mark facing out.
  - g. Install the new filter (**Figure 18**) into the crankcase.
  - h. Make sure the small O-ring seal (**Figure 17**) is in place in the right-hand crankcase half.
  - i. Install the filter cover and bolts. Tighten the bolts to the torque specification listed in **Table 3**.
9. Inspect the sealing washer on the drain plug, replace if necessary.
  10. Install the drain plug and tighten to the torque specification listed in **Table 3**.
  11. Insert a funnel into the oil fill hole and fill the engine with the correct weight and quantity oil. Refer to **Table 4** for refill capacities.
  12. Screw in the dipstick/oil fill cap securely.
  13. If the engine has been rebuilt or disassembled, turn both the ignition switch and the engine kill switch to the OFF position and use the kickstarter or starter a couple of times to help distribute the oil throughout the engine.
  14. Start the engine and let the engine run at moderate speed and check for leaks.
  15. Turn the engine off and check for correct oil level; adjust as necessary.

#### WARNING

*Prolonged contact with used oil may cause skin cancer. It is advisable to thoroughly wash your hands with soap and water as soon as possible after handling or coming in contact with used motor oil.*

### Engine Oil Filter Screen Cleaning

The oil filter screen should be cleaned at the factory recommended interval listed in **Table 1**. This assumes that the vehicle is operated in moderate climates. If it is operated under dusty conditions, the oil will get dirty more quickly and should be changed more frequently than recommended.

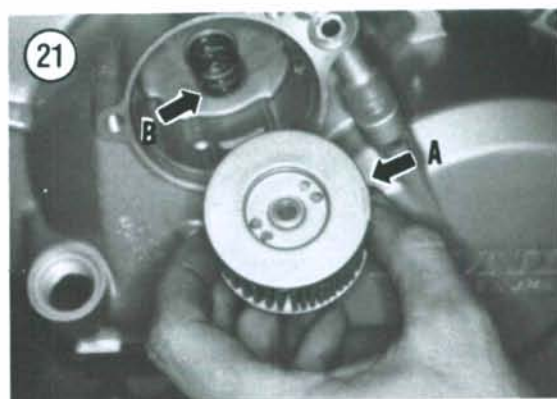
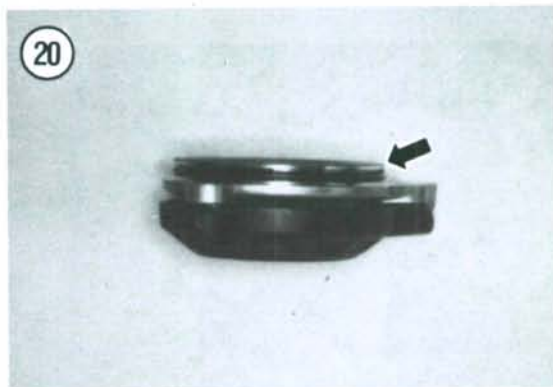
1. Remove the right-hand crankcase cover as described in Chapter Four.
2. Use needle-nose pliers and remove the oil filter screen (**Figure 22**) from the crankcase.
3. Clean the screen in solvent with a medium soft toothbrush and carefully dry with compressed air.

4. Inspect the screen; replace it if there are any breaks or holes in the screen.
5. Install the screen with the thick end going in last (**Figure 23**) and install the screen into the crankcase. Push it in until it bottoms out.
6. Install the right-hand crankcase cover as described in Chapter Four.
7. Fill the crankcase with the recommended weight and quantity of oil as described in this chapter.

### Front Gear Case (4-Wheel Drive)

#### Oil level check

1. Place the vehicle on level ground and set the parking brake.
2. The vehicle must be level for a correct reading. Remove the oil check bolt (A, **Figure 24**). Oil should flow out of the hole. If oil flows out of the hole, reinstall the check bolt and tighten securely.
3. If there is no oil flow, remove the oil fill cap and add the recommended type oil until the oil flows out of the hole.



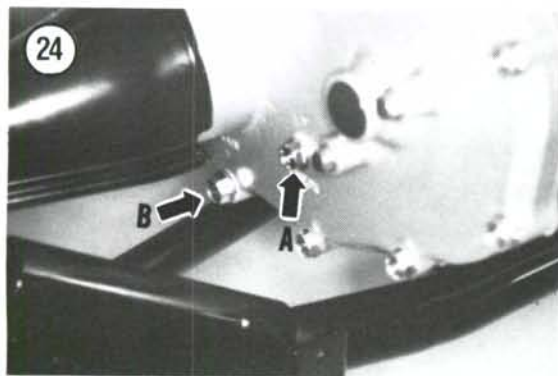
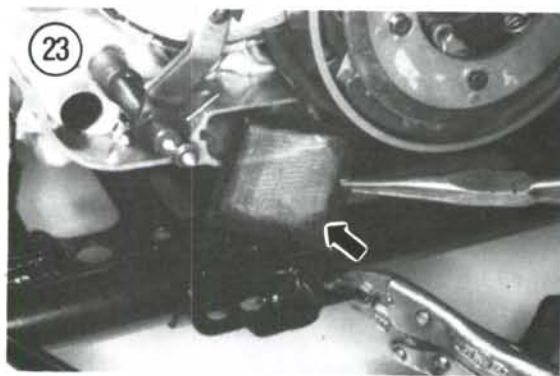
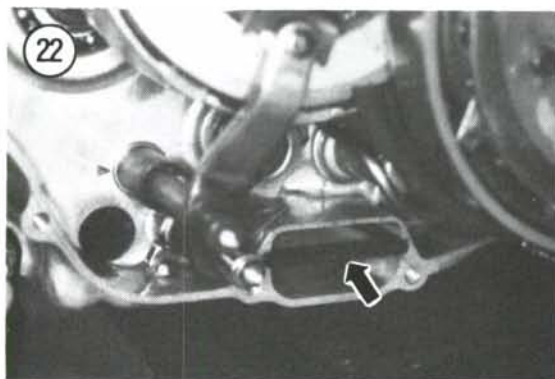
4. Install the check bolt and the fill cap and tighten both securely.

### Oil change

The factory recommended oil change interval is indicated in **Table 1** or whenever the oil becomes contaminated.

To drain the oil you will need the following:

- a. Drain pan.
- b. Funnel.



- c. Approximately 200 cc (6.8 oz.) of SAE 10W-40 engine oil.

Discard old oil in the same manner as outlined in *Engine Oil Change* in this chapter.

### NOTE

*A short ride allows the front gear case oil to heat up; thus it flows freely and carries contamination and any sludge buildup out with it.*

1. Ride the vehicle until normal operating temperature is reached. Usually 15-20 minutes of stop-and-go riding is sufficient.
2. Place the vehicle on level ground and set the parking brake.
3. Remove the bolts securing the engine skid plate and remove the skid plate.
4. Remove the oil fill cap (A, **Figure 24**).
5. Place a drain pan under the drain bolt.
6. Remove the 12 mm drain bolt (B, **Figure 24**).
7. Let the oil drain for at least 15-20 minutes to ensure that the majority of the oil has drained out.
8. Inspect the sealing washer on the drain bolt; replace if necessary.
9. Install the drain bolt and tighten to the torque specification listed in **Table 3**.
10. Insert a funnel into the oil fill cap hole and add the correct weight and quantity oil. Refer to **Table 4** for refill capacities.
11. Inspect the O-ring seal on the oil fill cap for wear or deterioration, replace if necessary.
12. Screw on the oil fill cap and tighten securely.
13. Install the engine skid plate and tighten the bolts securely.
14. Test ride the vehicle and check for leaks. After the test ride, recheck the oil level and adjust if necessary.

### Front Differential (4-Wheel Drive)

#### Oil level check

The oil level should be checked at the interval indicated in **Table 1**. The final drive unit should be cool. If the vehicle has been run, allow it to cool down, then check the oil level. When checking or changing the final drive oil, do not allow any dirt or foreign matter to enter the case opening.

1. Place the vehicle on level ground and set the parking brake.

**NOTE**

*Figure 25 is shown with the left-hand drive axle removed for clarity.*

2. Wipe the area around the oil fill cap clean and unscrew the oil fill cap (A, **Figure 25**).
3. The oil level is correct if the oil is up to the lower edge of the fill cap hole. If the oil level is low, add hypoid gear oil until the oil level is correct.

**NOTE**

*Use a good quality of SAE 80 hypoid gear oil.*

4. Inspect the O-ring seal on the oil fill cap for wear or deterioration, replace if necessary.
5. Screw on the oil fill cap and tighten to the torque specifications listed in **Table 3**.

### Oil change

The factory recommended oil change interval is indicated in **Table 1** or whenever the oil becomes contaminated.

To drain the oil you will need the following:

- a. Drain pan.
- b. Funnel.
- c. Approximately 90 cc (3.0 oz.) of SAE 80W hypoid gear oil.

Discard old oil in the same manner as outlined in *Engine Oil Change* in this chapter.

**NOTE**

*A short ride allows the front differential gear case oil to heat up; thus it flows freely and carries contamination and any sludge buildup out with it.*

1. Ride the vehicle until normal operating temperature is reached. Usually 15-20 minutes of stop-and-go riding is sufficient.
2. Place the vehicle on level ground and set the parking brake.
3. Place a drain pan under the drain bolt.

**NOTE**

*Figure 25 is shown with the left-hand drive axle removed for clarity.*

4. Remove the oil fill cap (A, **Figure 25**).

5. Use a piece of U-channel metal or plastic as an oil guide to direct the oil out of the drain hole and over the frame rail.

6. Remove the 10 mm drain bolt (B, **Figure 25**).

7. Let the oil drain for at least 15-20 minutes to ensure that the majority of the oil has drained out.

8. Inspect the sealing washer on the drain bolt; replace if necessary.

9. Install the drain bolt and tighten to the torque specification listed in **Table 3**.

**NOTE**

*Use a good quality of SAE 80 hypoid gear oil.*

10. Insert a funnel into the oil fill cap hole and add the recommended type and quantity of gear oil.

11. Remove the funnel and make sure the oil comes up to the bottom of the oil fill cap hole. Add additional oil if necessary.

12. Inspect the O-ring seal on the oil fill cap for wear or deterioration, replace if necessary.

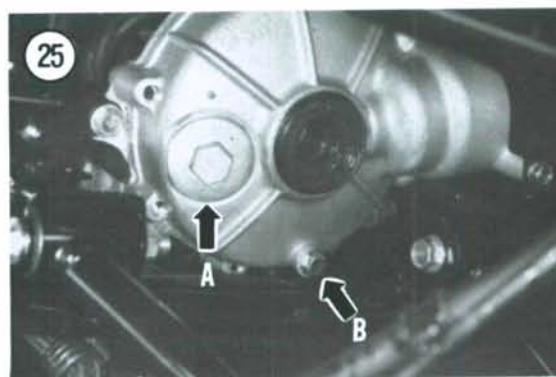
13. Install the oil fill cap and tighten to the torque specification listed in **Table 4**.

14. Test ride the vehicle and check for leaks. After the test ride recheck the oil level and adjust if necessary.

### Final Drive Unit

#### Oil level check

The oil level should be checked at the interval indicated in **Table 1**. The final drive unit should be cool. If the vehicle has been run, allow it to cool down, then check the oil level. When checking or



changing the final drive oil, do not allow any dirt or foreign matter to enter the case opening.

1. Place the vehicle on level ground and set the parking brake.
2. Wipe the area around the oil fill cap clean and unscrew the oil fill cap (**Figure 26**).
3. The oil level is correct if the oil is up to the lower edge of the fill cap hole. If the oil level is low, add hypoid gear oil until the oil level is correct.

#### NOTE

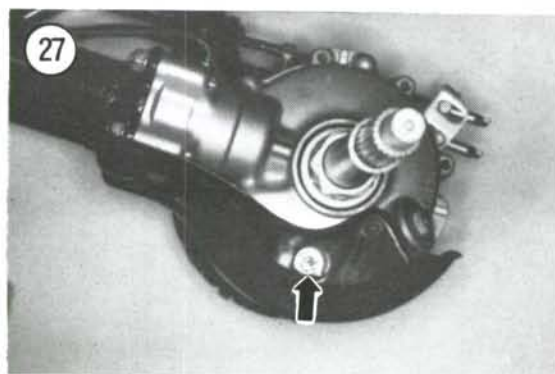
*Use a good quality of SAE 80 hypoid gear oil.*

4. Inspect the O-ring seal on the oil fill cap for wear or deterioration, replace if necessary.
5. Screw on the oil fill cap and tighten to the torque specification listed in **Table 3**.

### Oil change

The factory recommended oil change interval is indicated in **Table 1** or whenever the oil becomes contaminated.

To drain the oil you will need the following:



- a. Drain pan.
- b. Funnel.
- c. Approximately 90 cc (3.0 oz.) of SAE 80 hypoid gear oil.

Discard old oil in the same manner as outlined in *Engine Oil Change* in this chapter.

#### NOTE

*A short ride allows the final drive unit oil to heat up; thus it flows freely and carries contamination and any sludge buildup out with it.*

1. Ride the vehicle until normal operating temperature is reached. Usually 15-20 minutes of stop-and-go riding is sufficient.
2. Place the vehicle on level ground and set the parking brake.
3. Place a drain pan under the drain bolt.
4. Remove the oil fill cap (**Figure 26**).
5. Remove the drain bolt (**Figure 27**).
6. Let the oil drain for at least 15-20 minutes to ensure that the majority of the oil has drained out.
7. Inspect the sealing washer on the drain bolt; replace if necessary.
8. Install the drain bolt and tighten to the torque specification listed in **Table 3**.

#### NOTE

*Use a good quality of SAE 80 hypoid gear oil.*

9. Insert a funnel into the oil fill cap hole and add the recommended type and quantity of gear oil.
10. Remove the funnel and make sure the oil comes up to the bottom of the oil fill cap hole. Add additional oil if necessary.
11. Inspect the O-ring seal on the oil fill cap for wear or deterioration, replace if necessary.
12. Install the oil fill cap and tighten to the torque specification listed in **Table 3**.
13. Test ride the vehicle and check for leaks. After the test ride recheck the oil level and adjust if necessary.

### Control Cables

The control cables should be lubricated at the interval indicated in **Table 1**. They should also be inspected at this time for fraying and the cable sheath should be checked for chafing. The cables are rela-

tively inexpensive and should be replaced when found to be faulty.

The control cables can be lubricated either with oil or with any of the popular cable lubricants and a cable lubricator. The first method requires more time and the complete lubrication of the entire cable is less certain.

### Oil method

1. Disconnect the cable from the throttle, choke and both the front and rear brake levers.
2. Make a cone of stiff paper and tape it to the end of the cable sheath.
3. Hold the cable upright and pour a small amount of light oil (SAE 10W/30) into the cone. Work the cable in and out of the sheath for several minutes to help the oil work its way down to the end of the cable.

#### NOTE

*To avoid a mess, place a shop cloth at the end of the cable to catch the oil as it runs out.*

4. Remove the cone, reconnect the cable and adjust the cable(s) as described in this chapter.

### Lubricator method

1. Disconnect the cables from the throttle, choke and both front and the rear brake levers.
2. Attach a lubricator following the manufacturer's instructions.
3. Insert the nozzle of the lubricant can in the lubricator, press the button on the can and hold it down until the lubricant begins to flow out of the other end of the cable.

#### NOTE

*Place a shop cloth at the end of the cable(s) to catch all excess lubricant that will flow out.*

4. Remove the lubricator, reconnect the cable(s) and adjust the cable(s) as described in this chapter.

### Steering Shaft Holder Bearing Lubrication

Grease the steering shaft holder bearing at the interval indicated in **Table 1**. Use a good grade multipurpose grease.

The steering shaft must be partially disassembled for this procedure; refer to Chapter Nine.

### Miscellaneous Lubrication Points

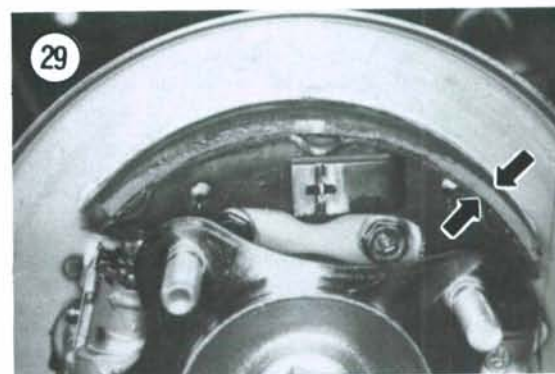
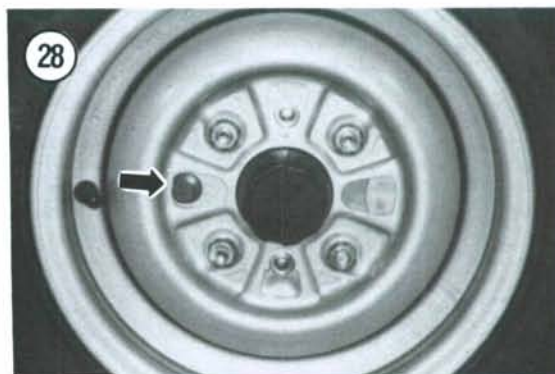
Lubricate the front brake lever, rear brake lever and rear brake pedal pivot points.

## PERIODIC MAINTENANCE

### Front Brake Lining Inspection

At the interval indicated in **Table 1**, inspect the front brake lining thickness. The front brakes are not equipped with wear indicators.

1. Remove the rubber inspection cap (**Figure 28**) from the front wheel and brake drum.
2. Move the vehicle in either direction until the inspection hole aligns with one of the brake linings.



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